Title

Trends in Educational Assortative Mating in Post-Socialist Central Europe: Czech Republic, Slovakia, Poland, and Hungary Between 1988 and 2000

Authors

Katrnak, Tomas
Kreidl, M
Fonadova, Laura

Publication Date

2005-10-12

California Center for Population Research
University of California - Los Angeles

Trends in Educational Assortative Mating in Post-Socialist Central Europe: Czech Republic, Slovakia, Poland, and Hungary Between 1988 and 2000

Tomas Katrnak
Martin Kreidl
Laura Fonadova

CCPR-033-05

October 2005

California Center for Population Research
On-Line Working Paper Series

TRENDS IN EDUCATIONAL ASSORTATIVE MATING IN POST-SOCIALIST CENTRAL EUROPE: CZECH REPUBLIC, SLOVAKIA, POLAND, AND HUNGARY BETWEEN 1988 AND 2000

TOMÁŠ KATRŇÁK
Department of Sociology, Masaryk University, Brno, Czech Republic

MARTIN KREIDL
Department of Sociology, UCLA, USA

LAURA FÓNADOVÁ
Department of Sociology, Masaryk University, Brno, Czech Republic

The number of words in plain text (endnotes included): 7 205

Last revised: 10/12/2005

TRENDS IN EDUCATIONAL ASSORTATIVE MATING IN POST-SOCIALIST CENTRAL EUROPE: CZECH REPUBLIC, SLOVAKIA, POLAND, AND HUNGARY BETWEEN 1988 AND 2000

ABSTRACT

This article analyzes trends in educational homogamy in the Czech Republic, Slovakia, Poland and Hungary from 1988 to 2000. Our initial hypothesis is that educational homogamy strengthened in post-socialist countries as a result of changing socio-economic conditions during the post-communist transformation. We argue that people's behavior changes in reaction to a new socio-economic environment where risks associated with a poor marital match are more pronounced. We analyze key statistical data on all new marriages in the years 1988, 1991, 1994, 1997 and 2000 in each country. Log-linear and log-multiplicative models led to the rejection of our initial hypothesis. Between 1988 and 2000 educational homogamy remained low and constant in the Czech Republic and high and constant in Poland, whereas it increased slightly in Hungary and rather significantly in Slovakia. The article concludes with a discussion of some possible explanations of these varied trends in educational homogamy with regards to changes in demographic as well as social mobility processes in former socialist countries during the 1990s.

INTRODUCTION

While many people may think that marriage is an individual decision driven by personal affection and taste, it appears that marriage pairings follow regular patterns at the aggregate societal level. Spouses tend to have similar family backgrounds and educational levels, belong to the same social class, race/ethnicity, religious and age group more often than we would expect if assortative mating was a purely random process (Ultee and Luijkx, 1990; Kalmijn, 1991a, 1991b; Mare, 1991; Smits, Ultee and Lammers, 1998a, 1998b, 2000; Raymo and Xie, 2000; Smits, 2002). While in the first part of the 20th century social scientists uncovered the social structuring of marital decisions (see e.g. Hunt, 1940; Burgess and Wallin, 1943; Winch, 1958; Girard, 1964), toward the end of the 20th century they mostly concentrated on measuring marital homogamy and studying its inter-generational and spatial variability.

Whereas any social tie that crosses the boundaries of one's own group, no matter how it is defined, contributes to societal openness, marriage seems to be of particular importance because it creates intimate and relatively stable bonds not only between the two spouses involved but usually also between their families and kin. Therefore marital homogamy is often seen as a useful and powerful indicator of societal openness. For instance, Smits, Ultee and Lammers argue that "(a) society in which many marriages take place between persons belonging to different social groups (…) can be considered a more open society than one in which few socially mixed marriages occur" (1998a: 265).

There are many links between the study of social mobility and marriage pairings. First, assortative mating was historically an inherent part of mobility studies, scholars distinguished intergenerational mobility through the labor market and intergenerational mobility through marriage (e.g. Rubin, 1968; Glenn, Ross, and Tully 1974). Secondly, Smits, Ultee and Lammers (1998b) as well as Ultee and Luijkx (1990) found that countries with higher levels of educational heterogamy also show higher levels of intergenerational occupational mobility. Thirdly, marital homogamy characterized by socioeconomic indicators such as education and occupation implies, ceteris paribus, higher inequality in the society as a whole because partners share resources and thus the overall level of inequality is an aggregate of inequality among households (Smits, 2003; Smits, Ultee and Lammers, 1998a). Fourthly, homogamy has considerable implications for family life and both partners' life trajectories. For instance, a spouse's education and occupation have a net positive effect on one's own

employment prospects, occupational standing, and earnings, at least in some societies (Benham, 1974; Ultee, Dessens and Jansen, 1988; Smits, Ultee and Lammers 1996; Blossfeld and Drobnič, 2001). Fifthly, because many socially relevant traits are inherited or learned from parents, assortative mating patterns together with other factors determine the composition of population in the next generation (Mare, 2000; de la Croix and Doepke, 2003). Homogamy then becomes not only an indicator, but also a source of inequality (Kalmijn, 1998).

In this text we make a contribution to the existing literature on educational homogamy. We develop and empirically test arguments about the effects of rapidly growing economic inequality on patterns of educational homogamy of new marriages in four Central European countries between 1988 and 2000. We want to show if and how people in the Czech Republic, Hungary, Poland and Slovakia responded to changing economic conditions in terms of their behavior, namely whether they began to pay more attention to their partners' economic prospects – approximated here by education level – and thus increasingly made mating choices on the basis of education.

We discuss general theories of marital choice in the next section and then we proceed to outline the main theoretical approaches to the study of trends in educational homogamy. More specifically, we revisit modernization theory, the romantic love hypothesis and also their synthesis. We further focus on the relationship between educational homogamy and socioeconomic changes in the Central European region after 1989. It appears that theory points in one direction: educational homogamy should increase during the post-socialist transformation. Then we review our data and variables, outline our modeling strategy, and present the empirical results based on a series of log-linear and log-multiplicative models. The models show that the pattern of educational assortative mating changed in some countries only, while in some it remained intact. In the concluding section we link our results to other stratification research, namely studies of intergenerational social mobility under post-socialism. Finally, we summarize what other factors might have contributed to the divergent trends in educational homogamy.

GENERAL THEORIES OF PARTNER CHOICE AND EDUCATIONAL HOMOGAMY

Partner choice is determined both by *individual preferences* and the *structure of opportunities*. Individual preferences are usually theorized as shaped by rational economic calculations (the so-called *status attainment* or *status seeking hypothesis*, see e.g. Kalmijn,

1991a; Smits, Lammers and Ultee 1998a) as well as by cultural preferences and taste (the so-called *theory of the cultural similarity of spouses,* see e.g. Kerckhoff and Davis 1962, DiMaggio and Mohr, 1985, Kalmijn, 1994). The status attainment hypothesis stems from Becker's rational choice approach to families (Becker, 1981), while the cultural preference argument builds on the ideas of status groups (Weber, 1946) and class cultures (Katz-Gerro, 2002). In contrast, marriage opportunities are structured by social institutions such as education, the labor market, church, and leisure time associations that determine who meets whom (Kalmijn and Flap, 2001).

Becker (1981) presents a simple economic "role specialization model" of marital choice. He argues that the advantages of marriage for both partners stem from high role specialization between spouses and the trading – within marriage – of the relative competitive advantage of each partner. Thus, one partner (usually the husband) specializes in labor market work, while the other partner (usually the wife) specializes in domestic work. Therefore, the theory predicts that educationally heterogamous couples are economically more advantageous for both partners and, as a consequence, are more likely to emerge and persist.

Becker's theory has often been criticized as inadequate for describing marriage formation processes when both partners aspire to gainful employment outside the home and possess similar amounts and types of human capital (Kalmijn, 1991a, 1991b; Oppenheimer, 1994; Sweeney, 2002). In this situation, economically rational assortative mating would require that both sexes symmetrically prefer a partner with a high status and earning potential (Oppenheimer, 1988; Blossfeld and Huink, 1991) and try to maximize status via marriage – a situation that Smits, Ultee and Lammers (1998a) call *status attainment hypothesis*. When both sexes prefer high status partners and are not willing to accept a partner with a status lower than their own, marriage markets will tend to an equilibrium in which most men and women marry homogamously with respect to socioeconomic statuses (Kalmijn, 1998).

Partner choice may be, however, also driven by non-economic individual preferences. People may, for instance, have a preference for a partner with similar values and attitudes; they may, consciously or unconsciously, prefer someone with a similar language, taste or life style (DiMaggio and Mohr, 1985; Kalmijn, 1994, 1998). Because the idea of who is an attractive partner as well as life styles, behaviors, values, attitudes and taste are stratified in society (DiMaggio, 1982; Mohr and DiMaggio, 1995; Birkelund and Heldal, 2003; Tomlinson, 2003), preference for cultural similarity between partners will, therefore, also lead to educational and status homogamy.

Kalmijn and Flap (2001) argue that partner choice is strongly determined by *social structures and institutions* that segment marriage markets, because "mating requires meeting". They show that partners who meet in an institutional setting (e.g. school, work, church, neighborhood and voluntary association) are much more homogamous with respect to age, education, class destination, class origin and religious background than partners who did not share a common institutional setting before they first met.

Kalmijn and Flap (2001) also show that school has a very strong positive effect on all types of marital homogamy they measured. Moreover, they documented the declining effect of school attendance on assortative mating over the life course and showed that while early marriages are very homogamous, the level of homogamy decreases among partners marrying at an older age, probably as a result of growing exposure to more heterogamous institutional settings such as the workplace and leisure time associations (cf. Mare, 1991; Smits, Ultee and Lammers, 1998b; Bernardi, 2003). Alternatively, we can explain decreasing educational homogamy over the life course as a result of changing individual preferences. For instance, Lichter (1990), Mare (1991) and Lewis and Oppenheimer (2000) argue that as people age and fail to find a suitable partner they may redefine their selection criteria to reflect the shrinking pool of available partners and thus may be more willing to be satisfied with a heterogamous match. A number of studies from the US (Mare, 1991), Hungary (Bukodi, 2002), Italy (Bernardi, 2003) and Britain (Chan and Halpin, 2000) document this life course effect on educational homogamy.

Recently Schwarz and Mare (2003) suggested that the relationship between age and the level of educational homogamy is not simply linear, but rather follows an inverted U pattern. Very young people may match in terms of expected education, may be less attached to careers or may believe that post-marital socialization is more likely (cf. Alexander and Reilly, 1981; Alwin and Thornton, 1984) and as a consequence, levels of educational homogamy at a very young age may be relatively low. It is, Schwarz and Mare (2003) believe, only in older age that people's actual education levels match. The level of educational homogamy is then high in mid-life only to drop among the eldest fiancées who may altogether disregard education as a mating criterion.

TRENDS IN EDUCATIONAL ASSORTATIVE MATING

Modernization theory predicts increasing educational homogamy in the long run (Smits, Ultee and Lammers, 1998a, 1998b, 2000). The process of modernization alters the principles that channel individuals into positions in the social structure leading to increased achievement and reduced ascription (Treiman, 1970; Treiman and Yip, 1989). Many factors contribute to this trend including the increasing dependency of modern economy on specialized knowledge and skills (Kerr, 1983), the growing predominance of large, highly bureaucratized organizations in the economy (Treiman, 1970), the declining sizes of classes with highest levels of occupational inheritance (DeGraaf and Luijkx, 1993), a value change favoring universalism over particularism (Lenski, 1966; Parsons, 1970) and the growing proportion of college graduates in the labor force (Hout, 1988). As education becomes the key determinant of occupational and economic status and as it overrides the influence of family background on one's social standing, individual actors with preference for status attainment through marriage will, other things being equal, primarily mate on the basis of the educational and not the social background (cf. Kalmijn, 1991a, 1994; Ultee and Luijkx 1990). Consequently, modernization should bring about increasing educational homogamy.

However, modernization may, at least at the higher levels of development, contribute to shrinking levels of educational homogamy, which reflect an inherent tendency towards more openness and fewer barriers between social groups. For instance, Smits, Ultee and Lammers (1998a) argue that industrialization significantly reduced class rigidities of agrarian societies. Treiman (1970) similarly points out that growing spatial mobility, urbanization, and mass communication advance one's chances of meeting people from different social strata. Furthermore, any two potential partners are more likely to share a common culture, language, and life style, which enhance their propensity to marry each other (Kalmijn, 1994).

The *romantic love hypothesis* also proposes that educational homogamy will dwindle with escalating modernization because modernity considerably transformed the institution of marriage (Goode, 1963, 1964). As the production function of households faded, the economic aspect of marriage was suppressed and the emotional and psychological aspects of marriage became increasingly emphasized. Therefore, industrialization reduces the need for families to control offspring's marital behavior. Furthermore, modernization diminishes the parents' ability to control their offspring's partner choices (Eckland, 1970; Kalmijn, 1991a).

Smits, Ultee, and Lammers (1998a) combine the above mentioned predictions into a single theory and conclude that the level of educational homogamy will follow an inverted U

pattern over time. In the first stage status seeking behavior should dominate in marriage markets and educational homogamy should grow. Because homogamy cannot grow infinitely, its growth would, everything else being equal, eventually level off and stabilize at a relatively high level. The second stage begins then and other forces commence to shape marital choices. Once societies reach a certain level of economic development and economic security, develop an advanced welfare state and achieve high wages, the opportunities for marriage based on love open up. The essence of this argument is that once people's economic needs become saturated they will be able to afford the luxury of romantic, status-blind love and disregard economic considerations in decisions about marriage.

EDUCATIONAL HOMOGAMY UNDER POST-SOCIALISM

It is rather unclear how to extend the above arguments to post-socialist societies of the 1990s because the modernization thesis implicitly assumes that all societies follow the same developmental trajectory, experience positive economic growth and modernize constantly. The theory is rather silent about what happens when these trends reverse.

All four post-socialist countries we study in this paper experienced significant economic setbacks in the early 1990s with their GDPs dropping as low as to about 80% of their 1989 value and all of them, except Poland, failed to exceed their pre-1989 GDP level before 2000. Whereas bankruptcy was unknown during socialism, it became a frequent economic phenomenon after 1989 (Kornai, 2001) and further destabilized employment and career patterns. The employment rate dropped in all post-socialist countries and the general unemployment rate, the number of long-term unemployed (Coricelli, 1998) as well as the rate of non-standard employment earnings instability (Förster and Tóth, 1998) and other aspects of labor market uncertainty (Förster and Tóth, 1997; Hamplová and Kreidl, forthcoming) increased remarkably in the 1990s. Mobility research indicates that we can expect that these changes correspond with a decrease in social mobility (empirical evidence for Russia and the former East Germany, cf. Gerber and Hout (2002) and Pollak and Müller (2002), respectively).

The omnipresent growing economic inequality of life is very likely to influence marital behavior as well. Individual actors on the marriage market are conceivably aware of the broader socio-economic changes and are therefore more likely than before to pay attention to the economic prospects of their potential mates. A partner with a high earning potential may be, more than ever before, perceived as an avenue to one's own economic

security, financial stability and better social standing. Clearly, post-socialist societies are in the first of the two stages that make up the inverted U pattern of educational homogamy as distinguished by Smits, Ultee, and Lammers (1998a) and status seeking should be the predominant form of marriage pairing.

Because education became a key determinant of economic success during the post-socialist transition, status seeking is likely to rely on education as a good approximation of economic potential. For instance, the correlation between unemployment and the level of education has become more pronounced (Frýdmanová et al. 1999; Keune, 1997) and the economic returns on education have increased dramatically (Večerník, 1999; Psacharopoulos and Patrinos, 2002). Moreover, the correlation between education, employment status and earnings has augmented (Matějů and Kreidl 2001), and the perceived importance of education for life success has grown (Kreidl 2000). In addition, fear of unemployment and feelings of uncertainty were also strongly stratified by educational attainment (Hraba et al. 2002).

We hypothesize that *educational homogamy increased in Czech, Slovak, Polish and Hungarian societies after 1989* (hypothesis 1). We believe that this trend is the result of people's behavioral response to changing economic conditions, unemployment, and growing labor market uncertainty. We also hypothesize *that educational homogamy is more common at a younger age* as predicted by the life course theory of marital choice (hypothesis 2). We test this conjecture directly and we also control for age at entry into marriage in other models because the average age at first marriage rose significantly during the first decade of post-socialism in all analyzed countries (Recent Demographic Developments in Europe, 2000).

DATA DESCRIPTION AND TYPE OF ANALYSIS

We analyze all new marriages in the Czech Republic, Slovakia, Poland, and Hungary sorted by men's and women's educational level, age at marriage, year, and country. We distinguish four levels of education (elementary or less, secondary vocational training, complete secondary, and tertiary), two age groups (younger than or equal to 29 and 30 and older),[1] and five years (1988, 1991, 1994, 1997, and 2000). In aggregated form the data have the form of four four-way tables (one for each country) or one five-way table. We have organized the data by year and age at marriage in ten two-way sub-tables that show the frequency distribution of marriages by men's and women's educational level for each combination of country and year (cf. Appendix, Tables 5-8).[2]

The marginal row in each two-way sub-table shows the educational structure of men entering into marriage and the marginal column shows the educational structure of women entering into marriage in the given year, country, and age at marriage. The main diagonal represents educationally homogamous marriages. The figures above the main diagonal indicate marriages in which the woman attained a higher education than the man (the woman marries a man with lower education, from her viewpoint it is a hypogamous marriage, the man marries a woman with higher education, from his viewpoint it is a hypergamous marriage). The figures below the main diagonal represent marriages in which the man attained a higher education than the woman (from his viewpoint it is a hypogamous marriage as he marries a woman with lower education, from the woman's viewpoint it is a hypergamous marriage as she marries a man with higher education).

The change over years in the educational structure of men and women entering into marriage in each country is shown in Figure 1 for the younger age group (marriages entered before 29 years of age) and in Figure 2 for the older marriages (age at marriage 30 and over). In the younger group, the proportion of marriages of men with vocational training and of women with vocational training decreases and the proportion of marriages of women and men with high school education increases in all countries between the years 1988 and 2000. The proportion of marriages of men with elementary education and of women with elementary education decreased and the proportion of marriages of men with university education and of women with university education increased. In the older group, the proportion of marriages of men and women with elementary education decreased dramatically. These changes in the educational structure of men and women entering into marriage reflect, on the one hand, the remarkable changes in the educational structure in (post-)socialist countries during the last quarter of the 20th century and, on the other, they mirror the gendered distribution of education in (post-)socialist countries.

<Figure 1 and Figure 2 about here>

The sum of total percentages on the main diagonal, above and under it in each two-way sub-table by year and age at marriage in each country is shown in Table 1. Educationally homogamous marriages make up more than half of all marriages with the exception of Hungary in 1988 and 1991. Among heterogamous marriages man's hypergamy dominates slightly over woman's hypergamy – again with the exception of the year 1988 in Hungary. The proportion of educationally homogamous marriages is higher in the case of younger

marriages than in the case of marriages entered at older age (30 and over) in all countries, apart from Hungary in 1988 and 1991. The proportion of homogamous marriages in the young group varies between 57% and 60% in the Czech Republic, between 58% and 60% in Slovakia, 51% and 52%in Poland, and between 48% and 53% in Hungary, while in the older group it never exceeds 53%, 58%, 52%, and 51% in the Czech Republic, Slovakia, Poland, and Hungary, respectively. Among the younger marriages men's hypergamy and women's hypogamy is higher than men's hypogamy and women's hypergamy in the Czech Republic, Slovakia and Hungary, while among older marriages the opposite is true: the proportion of marriages in which the man attained a lower education than the woman is lower than the proportion of marriages in which the man attained a higher education than the woman. Poland is an exception in this respect. Among the younger and older marriages alike, men's hypergamy and women's hypogamy is more frequent than men's hypogamy and women's hypergamy.

<Table 1 about here>

We have seen in Figures 1 and 2 that educationally homogamous and heterogamous marriages are to some extent structurally determined by the gendered distribution of education in all four countries. For instance a typical structurally forced marriage can be expected between a man with vocational training and a woman with high school education. The proportion of men with vocational training in the younger group is about 10% higher than the proportion of women with the same level of schooling in each country. Similarly, the proportion of women with high school education is on average 10% higher than the proportion of men with high school education in each country. Because the disparities in educational attainment between men and women entering into marriage change somewhat over time, we test our main hypotheses using log-linear and log-multiplicative analyses that study the associations in frequency tables net of marginal distributions. The results then do not describe absolute homogamy but relative homogamy which gives a more accurate account of the intentions, motivations, and the conduct of people entering into marriage (for more on these analyses cf. Hout, 1983; Yamaguchi, 1987; Xie, 1992; Goodman and Hout, 1998, 2001; Powers and Xie, 2000).

LOG-LINEAR AND LOG-MULTIPLICATIVE MODELING OF EDUCATIONAL HOMOGAMY

Before the estimation of the log-linear and log-multiplicative models, we standardized the overall *n* in each two-way sub-table of marriages by man's and woman's educational levels to 25,000 marriages. For each country we thus gained a sample of marriages of the size of 250,000 and the overall number of marriages (*N*) for all the four countries was 1,000,000 marriages. We employ standardization of the table size in order to make individual sub-tables comparable and avoid a bias in the model selection process due to different *n* in each sub-table (Ultee and Luijkx, 1990; Smits, Ultee and Lamers, 1998a; Raymo and Xie, 2000).

Modeling trends in educational homogamy

We first study the association between wife's and husband's education, by the age at marriage, year, and country. The equation of the saturated model is as follows:

$$\begin{aligned}\log(F_{ijklm}^{MWAYC}) = {} & \lambda + \lambda_i^M + \lambda_j^W + \lambda_k^A + \lambda_l^Y + \lambda_m^C \\ & + \lambda_{ij}^{MW} + \lambda_{ik}^{MA} + \lambda_{il}^{MY} + \lambda_{im}^{MC} + \lambda_{jk}^{WA} + \lambda_{jl}^{WY} + \lambda_{jm}^{WC} + \lambda_{kl}^{AY} + \lambda_{km}^{AC} + \lambda_{lm}^{YC} \\ & + \lambda_{ijk}^{MWA} + \lambda_{ijl}^{MWY} + \lambda_{ijm}^{MWC} + \lambda_{ikl}^{MAY} + \lambda_{ikm}^{MAC} + \lambda_{ilm}^{MYC} + \lambda_{jkl}^{WAY} + \lambda_{jkm}^{WAC} + \lambda_{jlm}^{WYC} + \lambda_{klm}^{AYC} \\ & + \lambda_{ijkl}^{MWAY} + \lambda_{ijkm}^{MWAC} + \lambda_{ijlm}^{MWYC} + \lambda_{iklm}^{MAYC} + \lambda_{jklm}^{WAYC} + \lambda_{ijklm}^{MWAYC},\end{aligned}$$

where $\log(F_{ijklm}^{MWAYC})$ is the natural logarithm of the expected frequency for row *i* (*M* - men's educational level), column *j* (*W* - women's educational level), layer *k* (*A* - age at marriage), dimension *l* (*Y* - years) and dimension *m* (*C* - country) in the five-way table; λ (lambda) are parameters, while λ is the main mean, $\lambda_i^M, \lambda_j^W, \lambda_k^A, \lambda_l^Y, \lambda_m^C$ are the marginal effects of the variables *M*, *W, A, Y* and *C*, $\lambda_{ij}^{MW}, \lambda_{ik}^{MA}, \lambda_{il}^{MY}, \lambda_{im}^{MC}, \lambda_{jk}^{WA}, \lambda_{jl}^{WY}, \lambda_{jm}^{WC}, \lambda_{kl}^{AY}, \lambda_{km}^{AC}, \lambda_{lm}^{YC}$ are two-way associations among variables *M*, *W, A, Y* and *C*, $\lambda_{ijk}^{MWA} \lambda_{ijl}^{MWY} \lambda_{ijm}^{MWC} \lambda_{ikl}^{MAY} \lambda_{ikm}^{MAC} \lambda_{ilm}^{MYC} \lambda_{jkl}^{WAY} \lambda_{jkm}^{WCA} \lambda_{jlm}^{WYC} \lambda_{klm}^{AYC}$ are three-way interactions among variables *M*, *W, A, Y* and *C*, $\lambda_{ijkl}^{MWAY} \lambda_{ijkm}^{MWAC} \lambda_{ijlm}^{MWYC} \lambda_{iklm}^{MAYC} \lambda_{jklm}^{WAYC}$ are four-way interactions among variables *M*, *W, A, Y* and *C*, and λ_{ijklm}^{MWAYC} denotes the five-way interaction among variables *M*, *W, A, Y* and *C*.

Since we were interested in the development of the association between men's and women's educational level by age at marriage, by the year of entry into marriage and by the country, we concentrated on the modeling of the two-way *MW* association and all higher

order interactions between the *MW* association and other variables ($\lambda_{ij}^{MW}, \lambda_{ijk}^{MWA}, \lambda_{ijl}^{MWY}, \lambda_{ijm}^{MWC}, \lambda_{ijkl}^{MWAY}, \lambda_{ijkm}^{MWAC}, \lambda_{ijlm}^{MWYC}, \lambda_{ijklm}^{MWAYC}$). First we estimated the null association model, which we used as a baseline model ($\lambda_{ij}^{MW} = \lambda_{ijk}^{MWA} = \lambda_{ijl}^{MWY} = \lambda_{ijm}^{MWC} = \lambda_{ijkl}^{MWAY} = \lambda_{ijkm}^{MWAC} = \lambda_{ijlm}^{MWYC} = \lambda_{ijklm}^{MWAYC} = 0$). Then, we estimated the constant association model, where the *MW* association is constant by *C*, *A,* and *Y* ($\lambda_{ijk}^{MWA} = \lambda_{ijl}^{MWY} = \lambda_{ijm}^{MWC} = \lambda_{ijkl}^{MWAY} = \lambda_{ijkm}^{MWAC} = \lambda_{ijlm}^{MWYC} = \lambda_{ijklm}^{MWAYC} = 0$), and the constant association model with blocked main diagonal in each *M* x *W* sub-table.[3] Furthermore, we modeled the *MW* association as additive uniform and as log-multiplicative uniform.

The additive uniform layer effect model (Yamaguchi, 1987) means that the *MW* association is estimated as constant in all sub-tables and its higher order interactions are modeled on the assumption of a specific order of rows and columns in the sub-tables as a sum of this two-way association and an estimated parameter β, which indicates the change in the strength of *MW* association by *C*, *A,* and *Y* ($\lambda_{ij}^{MW} + \lambda_{ijk}^{MWA} + \lambda_{ijl}^{MWY} + \lambda_{ijm}^{MWC} + \lambda_{ijkl}^{MWAY} + \lambda_{ijkm}^{MWAC} + \lambda_{ijlm}^{MWYC} + \lambda_{ijklm}^{MWAYC} = \lambda_{ij}^{MW} + ij\beta_{klm}$).

The log-multiplicative uniform layer effect model (Xie, 1992) is constructed on a similar principle as the additive uniform layer effect model. A two-way association of *MW* is estimated as constant for all sub-tables, and its higher order interactions are modeled as a product of this two-way interaction and an estimated parameter φ, which shows the changes in the strength of the two-way interaction by *C*, *A,* and *Y*. ($\lambda_{ij}^{MW} + \lambda_{ijk}^{MWA} + \lambda_{ijl}^{MWY} + \lambda_{ijm}^{MWC} + \lambda_{ijkl}^{MWAY} + \lambda_{ijkm}^{MWAC} + \lambda_{ijlm}^{MWYC} + \lambda_{ijklm}^{MWAYC} = \psi_{ij}\varphi_{klm}$). An additional advantage of the log-multiplicative model is that it does not presuppose an ordering of rows and columns in the tables and is more intuitive to interpret.

Modeling change in the pattern of educational homogamy

The above models can, if they fit the data satisfactorily, indicate differences in educational homogamy across countries, over time, and between groups defined by age at marriage. They are, however, powerless to describe the change in the pattern of association because they keep the *MW* association constant and only allow for additive or multiplicative deviations of the same pattern over other dimensions of the data. In the next section of the analysis, we therefore concentrated on the change in the pattern of educational assortative mating. Models in this section were estimated for the younger couples only (couples that entered into marriage before the age of 29) and for each country separately. We decided

to limit the analysis to the younger marriages within each country for both substantive and methodological reasons. The methodological reason is that we use the Goodman-Hout regression type layer effect model (Goodman and Hout, 1998, 2001), which, as far as we can tell, has so far been identified for three-way tables only. We believe that the statistical and conceptual advantages of the Goodman-Hout model far outweigh the disadvantages resulting from the necessity to break the analysis up by country and explore only one age group.[4] The substantive reason for limiting the investigation to younger marriages is that most of the younger marriages, unlike marriages entered at an older age, are first marriages, and we mostly expect that first marriages to be sensitive to changing economic, social and political environments during the 1990s in former socialist countries.

The equation of the saturated model was the following:

$$\log(F_{ijk}^{MWY}) = \lambda + \lambda_i^M + \lambda_j^W + \lambda_k^Y + \lambda_{ik}^{MY} + \lambda_{jk}^{WY} + \lambda_{ij}^{MW} + \lambda_{ijk}^{MWY},$$

where $\log(F_{ijk}^{MWY})$ is the natural logarithm of expected frequency for row *i* (*M*), column *j* (*W*) and layer *k* (*Y*).Similarly to the previous model, λ is the main mean, $\lambda_i^M \lambda_j^W \lambda_k^Y$ are marginal effects of variables *M*, *W* and *Y*, $\lambda_{ik}^{MY}, \lambda_{jk}^{WY}, \lambda_{ij}^{MW}$ are two-way association among the variables *M*, *W* and *Y*, and λ_{ijk}^{MWY} is the three-way interaction among the variables *M*, *W,* and *Y*.

Similarly to the previous analysis also in this case we concentrated on constraints on the parameters $\lambda_{ij}^{MW} + \lambda_{ijk}^{MWY}$, which were first modeled as $\lambda_{ijk}^{MWY} = 0$ (constant association model), and afterwards as $\lambda_{ij}^{MW} + \lambda_{ijk}^{MWY} = \lambda_{ij}^{MW} + ij\beta_k$ (additive uniform layer effect model), as $\lambda_{ij}^{MW} + \lambda_{ijk}^{MWY} = \psi_{ij}\varphi_k$ (log-multiplicative uniform layer effect model), and lastly as $\lambda_{ij}^{MW} + \lambda_{ijk}^{MWY} = \lambda_{ij}^{MW} + \psi_{ij}\varphi_k$ (regression type layer effect model).

Regression type layer effect model, offered by Goodman and Hout (1998, 2001), is an alternative way for analyzing the trends in association between two categorical variables over a third variable. This model is a combination of the additive uniform layer effect model and the log-multiplicative uniform layer effect model, which are in fact nested in it. Whereas in the log-multiplicative model $\psi_{ij}\varphi_k$ term is used for the specification of both the *MW* association and the *MWY* interaction, in the regression type layer effect model the same term is used only for the specification of *MWY* interaction, and for the specification of *MW*

association the λ_{ij}^{MW} parameter is used as in the additive uniform layer effect model. The *MWY* interaction can then be interpreted as a deviation from an overall pattern of association indicated by the parameter λ_{ij}^{MW}. The ψ_{ij} parameter in this deviation represents the part of the association which varies over years and the φ_k parameter indicates the strength of the association in each year.

RESULTS

Has there been a change in the strength of educational homogamy?

The goodness-of-fit statistics of all models are presented in Table 2.[5] Model 1 is the null association model. This model fits the data very poorly – it has positive BIC (Raftery, 1986, 1995), it misclassified about 25% of all marriages and it has L^2 of 430 080 with 360 degrees of freedom. Model 2 is the constant association model and Model 3 is the constant association model with blocked main diagonal in each sub-table. Both models fit the data significantly better then the null association model. Moreover, Model 3 is statistically superior to Model 2 (L^2 for the contrast is 10 971 with 156 degrees of freedom, which is a very significant difference). All subsequent models are therefore estimated with blocked main diagonals. Both Model 4 (additive uniform effect) and Model 5 (log-multiplicative uniform effect) are conceptually good tests of trend in association between man's and woman's education level in marriage market and both models fit the data satisfactorily. Nevertheless our previous investigation of educational homogamy suggests that we can expect constant educational homogamy during the 1990s in the Czech population (Katrňák, Kreidl and Fónadová, 2004). Thus, we constrained the association parameters φ to be constant in the Czech Republic in Model 6. Model 6 is more parsimonious than Model 5 and performs statistically as satisfactorily as Model 5 according to L^2 (difference in L^2 between both models is 10.4 with 8 degrees of freedom). This model is also superior to Model 5 according to BIC criterion. In construction of Model 7, we came from the estimated association φ parameters of Model 6 and to get more parsimonious model we constrained them similarly as in the Model 6 (constant over years), but now for both Czech Republic and Poland. Model 7 is superior to Model 6 according to BIC criterion and performs as well as Model 6 according to L^2 (difference in L^2 between both models is 2 with 8 degrees of freedom). We interpreted the data on the basis of the parameters of this last model, although the substantive

conclusions are fairly insensitive to the details of concrete model specification and would not change if we used model 4, 5 or 6 instead.

<Table 2 about here>

Figure 3 shows the value of the estimated association parameter φ from Model 7. The vertical comparison within panels shows that in every country there is higher educational homogamy in younger marriages (under 29 age at marriage) than in older marriages (age at marriage 30 and over); the difference is, on average, 20%. Educational homogamy is the lowest in the Czech Republic and Hungary and is the highest in countries with high level of religiosity, namely Poland and Slovakia. The horizontal comparison across panels shows that educational homogamy strengthened slightly in Hungary and relatively strongly in Slovakia.

<Figure 3 about here>

Has the pattern of educational homogamy changed?

While the previous sub-section of the text has documented changes in the magnitude of the association between the education of wives and husbands, in this sub-section we would like to see if the pattern of association has changed as well. As we have argued before we limit models in this section to new marriages entered by fiancées younger than 29 in each country separately.

Table 3 summarizes the goodness-of-fit statistics of all models used to disentangle changes in the pattern of homogamy. Model 1 is a null association model, which assumes no *MW* association. This model fits the data poorly in each country. Model 2 – the constant association model – fits the data satisfactorily according to BIC criterion, especially in Czech and Polish data, while it is not so good according to classical inference in either country. Model 3 presupposes the additive uniform year effect on the *MW* association, Model 4 presupposes the log-multiplicative uniform year effect on the *MW* association, and Model 5 presupposes the regression type year effect on the *MW* association. In order to get a more parsimonious model we estimated also the regression-type model with year scores specified[6] – in Model 6 the φ parameters are fixed to the round values estimated in Model 5. Model 6 fits the data best in the case of Slovakia and Hungary according to BIC criterion and in the case of the Czech Republic and Poland it is Model 2 that fits the data most satisfactorily

according to BIC criterion. These models confirm our foregoing conclusion that educational homogamy did not change in the Czech Republic and Poland between 1988 and 2000 and that it changed rather significantly in Slovakia and Hungary.

<Table 3 about here>

Panel A of Table 4 shows the λ_{ij} parameters estimated from Model 6 for the two-way interaction of *MW* separately for Slovakia and Hungary. These parameters describe the association between men's and women's educational level in the year 2000.[7] The association is strongest in the cells on the main diagonal, in particular in the first and the last cell of the diagonal. Educational homogamy was the highest among university graduates and men and women with elementary education both in Slovakia and in Hungary in 2000. As we move father from the main diagonal, the association between partners' education dwindles proportionately. The highest negative association is between a man with elementary education and a college educated female and a woman with elementary education and a male college graduate. Interestingly, there is a positive association between heterogamous marriages of men and women with elementary education and men and women with vocational training. Similarly, there is a positive association between individuals with complete high school education and college education. It seems that the secondary school leaving examination is dividing the population into two largely isolated groups. Although within these groups there exists a strong educational homogamy, within them there are also relatively widespread heterogamous marriages. Heterogamous marriages that occur across these groups are, nevertheless, more of an exception than a rule.

The parameters ψ_{ij} and φ_k in panels B and C of Table 4 must be interpreted together. Whereas the λ_{ij} parameters in panel A of Table 4 describe the *MW* interaction in the year 2000, the ψ_i parameters indicate how the pattern of the *MW* interaction in the year 1988 deviates from the λ_{ij} parameters, i.e. from the *MW* interaction in 2000. The φ_k parameters in panel C of Table 4 reveal to what extent the deviations from panel B apply to each particular year. Clearly, the tendency towards homogamous marriages strengthened between 1988 and 2000 both in Hungary and Slovakia. The growing homogamy is most discernible among individuals with elementary education. For instance the homogamy parameter for men and women with elementary education was lower by -0.51 in 1988 than in 2000 in Slovakia. In Hungary this homogamy parameter was lower by -0.32 over the same period. There is also a distinct propensity towards weakening of heterogamy among men and women from the

opposite extremes of the educational hierarchy. For instance, heterogamy between a man with elementary education and a woman with high school education was higher by 0.38 in the year 1988 than in the year 2000 in Slovakia and this heterogamy parameter was higher by 0.18 in 1988 than in 2000 in Hungary. The φ parameters then show (panel C) that this change occurred relatively quickly in Slovakia, where it took place between the years 1991 and 1993, when the parameter of association φ changed from 0.9 to 0.2. The patterns of homogamy changed rather slowly and gradually in Hungary.

<Table 4 about here>

CONCLUSION AND DISCUSSION

This paper analyzed educational homogamy in the Czech Republic, Slovakia, Poland, and Hungary between 1988 and 2000. We first explored trends in educational assortative mating in all new marriages by age at marriage, country, and over years. Our study was inspired by the hypothesis that educational homogamy grows under post-socialism as people adjust their behavior in reaction to the changing socio-economic environment and begin to pay more attention to the economic potential of their possible mates. This hypothesis, while rooted in theory, was, however, not unambiguously empirically supported.

We found that between 1988 and 2000 educational homogamy remained low and constant in the Czech Republic and high and constant in Poland, while it increased slightly in Hungary and rather significantly in Slovakia. Hungary and Slovakia experienced not only a rise in educational homogamy, but also witnessed a transformation of the pattern of assortative matting. Educational homogamy intensified particularly among people with the lowest (elementary) and the highest (university) education. Educationally heterogeneous marriages retreated in general, but the trend is the more pronounced the further the difference between the educational attainment of both mates. The research also revealed that educational homogamy was higher among younger newlyweds than among older ones.

We conclude that the distances between people with varying levels of education did not change in response to the transition from socialism to capitalism in Czech and Polish societies, while in the Hungarian and Slovak societies the educational barriers swelled. Nevertheless, when we compare the overall degree of educational homogamy in all analyzed societies during the 1990s, we gather that the lowest educational distances are in the Czech

Republic and Hungary, whereas in Poland and Slovakia – countries with a much stronger religious, mostly Catholic, tradition – educational distances are higher.

Educational assortative mating indicates a divergence rather than a convergence in the development of societal openness in post-socialist countries during the 1990s. This conclusion is at odds with the findings of the most recent occupational mobility research, which found uniformly decreasing social mobility in former Soviet Bloc countries in the 1990s (Gerber and Hout 2002; Pollak and Müller 2002). Gerber and Hout (2002) explored intergenerational occupational mobility in the Russian society between 1988 and 2000 and demonstrated that similarly to the Hungarian and Slovak societies Russia experienced a societal closure. The same conclusion was also reached by Pollak and Müller (2002) who compared the development of intergenerational occupational mobility in the western and eastern parts of Germany and found that social fluidity weakened and the occupational structure of both societies was closing during the 1990s.

In comparison with both Gerber and Hout's (2002) and Pollak and Müller's (2002) results, our findings may be biased by the decline in the marriage rate and probable increase of cohabitation in former socialist countries during the 1990s. In each analyzed country there was an increase in the number of people in the 29-and-under age group who remained single. Our findings on the constant educational homogamy after 1989 in the Czech Republic and Poland in comparison with Hungary and Slovakia may be due to this decrease in the number of young females and males on the marriage market. In such a case, the trends in societal closure in the Czech Republic and Poland during the 1990s would be similar to those which Gerber and Hout (2002) identified in the Russian society, and Pollak and Müller (2002) in the former East Germany, and which correspond to our results from Hungary and Slovakia.

However, despite this caveat, we believe that the analyzed Central European countries are at the threshold of divergence. This view is supported by two auxiliary arguments. First, the decrease in the number of new marriages in the Czech Republic and Poland does not significantly outnumber the decrease in the number of new marriages in Hungary and Slovakia in the 1990s.[8] The number of young people who disappeared from the marriage market in the Czech Republic and Poland is not significantly higher than in Hungary and Slovakia in the 1990s. The number of potential cohabitations that would be educationally homogeneous in their partner preferences, but our analysis did not deal with them because they have not got married yet, is thus not higher in countries with a constant level of educational homogamy than in Hungary and Slovakia. And secondly, our research dealt with educational homogamy, whereas the support for a societal closure hypothesis in post-socialist

countries in the 1990s came from mobility research. It is hypothetically possible that the relationship between social mobility and marital homogamy in former socialist countries does not follow the same pattern as in western countries (Ultee and Luijkx, 1990; Smits, Ultee and Lammers, 1998a, 1998b) due to the fact that relative social mobility indicates distances among occupation (class) positions in the system of production while relative educational homogamy indicates distances among educational levels that exist in people's perceptions and that influence their marital decisions. In former socialist countries the relationship between relative social mobility and relative educational homogamy still remains unclear. More theoretical as well as empirical work is required to adjudicate those issues and present a challenge for further comparative research on the development of post-socialist social inequalities in Central European countries after 1989.

NOTES

[1] If one of the partner in the couple was younger than or equal to 29 and the other was older than or equal to 30 we included this marriage into the 30 and over age at marriage category.

[2] The data come from national statistical offices. Except for Czech data which were published in a statistical overview *Pohyb obyvatelstva v letech 1988 až 2000* (*Population change in years 1988 to 2000*), they have not been published yet.

[3] It is a standard practice to block the main diagonal in tables of marriage pairs, mobility tables, and other frequency tables of this type. The cells on the main diagonal are usually very high relative to the of-diagonal cells. This strong "hereditary effect" usually overrides any other pattern in the data and drives model selection and specification efforts, which is usually undesirable because other, more subtle patterns and associations remain hidden.

[4] While the Goodman-Hout model is a very powerful tool for the study of contingency tables, it has so far been rarely used in the scientific community. Besides Goodman and Hout (1998, 2001) mostly methodological articles with some substantive illustrations, this model was, as far as we know, used only twice in real research. Poppel, Liefbroer, Vermunt, and Smeenk (2001) employed this model to explore trends in marital age homogamy in the Netherlands between 1850- 1993 and Vallet (2002) used it in the analysis of trends in educational opportunity in France between 1908- 1972.

[5] We estimated all models in LEM program (Vermunt, 1997). The input data and syntax files for the replication of our models and results are freely available for download the following URL: http://www.fss.muni.cz/~katrnak. We would appreciate any feedback regarding out modeling efforts.

[6] Goodman and Hout (2001) use for this special case of regression type layer effect model abbreviation LSS (Layer Scores Specified). The specification yields standard log-linear model and no longer a log-bilinear model.

[7] The figures are in logarithmic form, they fall into the $<-\infty;\infty>$ interval, where 0 means that there is no association between the values of variables and the higher the number the stronger the positive association and the lower the number the stronger the negative association.

[8] Between 1988 and 2000 the number of new marriages entered before age 29 decreased from 59,792 to 33,914 (a decrease of 43%) in the Czech republic, from 30,958 to 19,015 (a decrease of 39%) in Slovakia, from 212,418 to 182,794 (a decrease of 14%) in Poland, and from 53,379 to 37,363 (a decrease of 30%) in Hungary (c.f. in Tables 5-8 total number of marriages in each sub-table, in Appendix).

ACKNOWLEDGEMENTS

The first author received primary support from the School of Social Studies, Masaryk University, Brno, Czech Republic (Grant CEZ: J07/98:142300002 - Children, Youth and Family). The second author received primary support from the Grant Agency of the Czech Academy of Sciences (grant # B7028202). Earlier version of this paper was presented at conference of ISA Research Committee on Social Stratification (RC28) at SIDOS, Neuchâtel, Switzerland, May 6- 9, 2004. We would like to thank Natalia Kanátová and Milan Žirko from the Slovak Statistical Office for the processing of Slovak data, Janusz Czarnecki from the Polish Statistical Office for processing the Polish data and Árpád Mészáros from the Hungarian Statistical Office for processing the Hungarian data. We would also like to thank Louis-Andre Valet and Jeroen K. Vermunt for their help with the specification of the Goodman-Hout model in program LEM.

REFERENCES

Alexander, K. L. and Reilly, T. W. (1981). Estimating the Effect of Marriage Timing on Educational Attainment: Some Procedural Issues and Substantive Clarifications. *American Journal of Sociology* **87**, 143–156.

Alwin, D. F. and Arland, T. (1984). Family Origins and the Schooling Process: Early vs. Late Influence of Parental Characteristics. *American Sociological Review* **49**, 784–802.

Becker, G. S. (1981). *A Treaties on the Family*. Cambridge: Harvard University Press.

Benham, L. (1974). Benefits of Women's Education within Marriage. *Journal of Political Economy* **82**, S57–S71.

Bernardi, F. (2003). Who Marries Whom in Italy. Changes in Educational Homogamy Across Cohorts and Over the Life-Course. In Blossfeld, P. H. and Timm, A (ed.), *Educational Systems as Marriage Markets in Modern Societies*. *A Comparison of Thirteen Countries*. Dordrecht: Kluwer Academic Publishers, pp. 111–138

Birkelund, E. G. and Heldal, J. (2003). Who Marries Whom? Educational Homogamy in Norway. *Demographic Research* **8,** article 1.

Blossfeld, H.-P. and Huinink, J. (1991). Human Capital Investments or Norms of Role Transition? How Women's Schooling and Career Affect the Process of Family Formation? *American Journal of Sociology* **97,** 143–168.

Blossfeld, H.-P. and Drobnič, S. (ed.) (2001). *Careers of Couples in Contemporary Societies. From Male Breadwinner to Dual Earner Families.* Oxford: Oxford University Press.

Bukodi, E. (2002). *Ki kivel (nem) házasodik? A partnerszelekciós minták változása az egyéni életútban és a történeti időben*. (Who does not Marry Whom? Changes in Patterns of Assortative Mating in Time and Over the Individual Life-Course). Unpublished Ph.D. thesis. Budapest: BKÁE.

Burgess, E. W. and Wallin, P. (1943). Homogamy in Social Characteristics. *American Journal of Sociology* **49,** 109–124.

Coricelli, F. (1998). *Macroeconomic Policies and the Developments of Markets in Transition Economies*. Budapest: CEU Press.

De Graaf, P. M. and Luijkx, R. (1993). Trends in the Status Attainment in the Netherlands from Ascription to Achievement. In Becker, H. A. and Hermkens, P. L. J (ed.). *Solidarity of Generations. Demographic, Economic and Social Change, and its Consequences. Volume I*. Amsterdam: Thesis Publishers, pp. 437–466.

de la Croix, D. and Doepke, M. (2003). Inequality and Growth: Why Differential Fertility Matters. *American Economic Review* **93**, 1091–1113.

DiMaggio, P. and Mohr, J. (1985). Cultural Capital, Educational Attainment, and Marital Selection. *American Journal of Sociology* **90**, 1231–1261.

DiMaggio, P. (1982). Cultural Capital and School Success: The Impact of Status Culture Participation the Grades of U.S. High School Students. *American Sociological Review* **47**, 189–201.

Eckland, K. B. (1970). New Mating Boundaries in Education. *Social Biology* **17**, 269–277.

Förster, M. F. and Tóth, I. G. (1997). Poverty, Inequalities and Social Policies in the Visegrad Countries. *Economics of Transition*, **5**, 505–510.

Förster, M. F. and Tóth, I. G. (1998). The Effects of Changing Labour Markets and Social Policies on Income Inequality and Poverty: Hungary and the Other Visegrad Countries Compared. *LIS Working Paper*, **177**, 1–14.

Frýdmanová, M., Janáček, K., Mareš, P. and Sirovátka, T. (1999). Labor Market and Human Resources. In Večerník, J. and Matějů, P. (ed.). *Ten Years of Rebuilding Capitalism. Czech Society after 1989*. Praha: Academia, pp. 21–43

Gerber, T. P. and Hout, H (2002). *Tightening Up: Social Mobility in Russia, 1988–2000*. Survey Research Center Working Paper. Berkeley: UC Berkeley. (http://ucdata.berkeley.edu/rsfcensus/papers/GerberHout.pdf)

Girard, A. (1964). *Le choix du conjoint. Une enquête psycho-sociologique en France*. Paris: INED-PUF.

Glenn, N. D., Ross, A. A. and Tully, J. C. (1974). Patterns of Intergenerational Mobility of Females through Marriage. *American Sociological Review* **39**, 683–699.

Goode, W. J. (1963). *World Revolution and Family Patterns.* New York: Free Press.

Goode, W. J. (1964). *The Family*. Englewood Cliffs: Prentice-Hall.

Goodman, L. A. and Hout, M. (1998). Statistical Methods and Graphical Displays for Analyzing How the Association Between Two Qualitative Variables Differs Among Countries, Among Groups or Over Time: A Modified Regression-Type Approach. *Sociological Methodology* **28**, 175–230.

Goodman, L. A. and Hout, M. (2001). Statistical Methods and Graphical Displays for Analyzing How the Association Between Two Qualitative Variables Differs Among Countries, Among Groups or Over Time. Part II: Some Explanatory Techniques, Simple Models, and Simple Examples. *Sociological Methodology* **31**, 189–221.

Hamplová, D. and Kreidl, M. (forthcoming). Globalization and Men's Occupational Mobility in the Czech Republic in the 1990s. In. Blossfeld, H. P. and Klijzing, E. (ed.). *The Winners in a Globalizing World: Mid-Career Men*. Oxford: Oxford University Press.

Hout, M. (1988). More Universalism, Less Structural Mobility: The American Occupational Structure in the 1980s. *American Journal of Sociology* **93**, 1358–1400.

Hout, M. (1983). *Mobility Tables.* Beverly Hills: Sage.

Hunt, T. C. (1940). Occupational Status and Marriage Selection. *American Sociological Review* **5**, 495–505.

Chan, T. W. and Halpin, B. (2000). *Who Marries Whom in Great Britain?* ISER Working Paper 2000/12. Colchester: Institute for Social and Economic Research, University of Essex.

Kalmijn, M. (1991a). Status Homogamy in the United States. *American Journal of Sociology* **97**, 496–523.

Kalmijn, M. (1991b). Shifting Boundaries: Trends in Religious and Educational Homogamy. *American Sociological Review* **56**, 786–800.

Kalmijn, M. and Flap, H. (2001). Assortative Meeting and Mating: Unintended Consequences of Organized Setting for Partner Choices. *Social Forces* **79**, 1289–1312.

Kalmijn, M. (1994). Assortative Mating by Cultural and Economic Occupational Status. *American Journal of Sociology* **100**, 422–452.

Kalmijn, M. (1998). Intermarriage and Homogamy: Causes, Patterns, and Trends. *Annual Review of Sociology* **24**, 395–421.

Katrňák, T., Kreidl, M. and Fónadová, L. (2004). Has the Post-communist Transformation Led to an Increase in Educational Homogamy in the Czech Republic after 1989? *Czech Sociological Review* **40**, 297–318.

Katz-Gerro, T. (2002). Highbrow Cultural Consumption and Class Distinction in Italy, Israel, West Germany, Sweden, and the United States. *Social Forces* **81**, 207–229.

Kerckhoff, A. C. and Davis, K. E (1962). Value Consensus and Need Complementarity in Mate Selection. *American Sociological Review* **27**, 295–303.

Kerr, C. (1983). *The Future of Industrial Society*. Cambridge: Harvard University Press.

Keune, M. (1997). *Youth Unemployment in Hungary and Poland. Employment and Training*. Papers (ILO), 20, (http://www.ilo.org/public/english/employment/strat/publ/etp20.htm)

Kornai, J. (2001). "Hardening the Budget Constraint: The Experience of the Post-Socialist Countries." *European Economic Review* **45**, 1573- 1599.

Kreidl, M. (2000). Změny v percepci životního úspěchu, bohatství a chudoby (Changes in the Perception of Life Success, Wealth and Poverty). In Matějů, P. and Vlachová, K. (ed.), *Nerovnosti, spravedlnost a politika. Česká republika 1991–1998 (Inequality, Justice and Politics. The Czech Republic 1991-1998).* Praha: Slon, pp. 191–224

Lenski, G. (1966). *Power and Privilege.* New York: McGrew Hill.

Lewis, S. K. and Oppenheimer, V. K. (2000). Educational Assortative Mating across Marriage Markets: Non-Hispanic Whites in the United States." *Demography* **37**, 29–40.

Lichter, D. T. (1990). Delayed Marriage, Marital Homogamy, and the Mate Selection Process among White Women. *Social Science Quarterly* **71**, 802–811.

Mare, R. D. (1991). Five Decades of Educational Assortative Mating. *American Sociological Review* **56**, 15–32.

Mare, R. D. (2000). *Assortative Mating, Intergenerational Mobility, and Educational Inequality*. California Center for Population research Working Paper 04/2000. Los Angeles: UCLA.

Matějů, P. and Kreidl, M. (2001). Rebuilding Status Consistency in a Post-Communist Society. The Czech Republic 1991- 1997. *Innovation* **14**, 17–34.

Mohr, J. and DiMaggio, P. (1995). The Intergenerational Transmission of Cultural Capital. *Research on Social stratification and Mobility* **14**, 167–199.

Oppenheimer, V. K (1988). A Theory of Marriage Timing. *American Journal of Sociology* **94**, 563–591.

Oppenheimer, V. K. (1994). Women's Rising Employment and the Future of the Family in Industrial Societies. *Population and Development Review* **20**, 293–342.

Parsons, T. (1970). Equality and Inequality in Modern Society, or Social Stratification Revisited. In Lauman, E. O. (ed.) *Social Stratification*. Indianapolis: Bobbs-Merrill, pp.56–81.

Pohyb obyvatelstva v letech 1988 až 2000. (*Population Change 1988-2000*) 1989-2001. Prague: Czech Statistical Office.

Pollak, R. and Müller, W. (2002). *Social Mobility in East and West Germany, 1991–2000. Re-unification of Two Mobility Spaces?* (http://www.nuff.ox.ac.uk/rc28/Papers/pollak.pdf)

Poppel, van F., Liefbroer, A. C., Vermunt, J. K., Smeenk, W. (2001). Love, Necessity and Opportunity: Changing Patterns of Marital Age Homogamy in the Netherlands, 1850–1993. *Population Studies* **55**, 1–14.

Powers, D. A. and Xie, Y. (2000). *Statistical Methods for Categorical Data Analysis.* San Diego: Academic Press.

Psacharopoulos, G. and Patrinos, H. A. (2002). *Returns to Investment in Education: A Further Update*. World Bank Policy Research Working Paper, 2881. (http://econ.worldbank.org/files/18081_wps2881.pdf)

Raftery, A. E. (1995). Bayesian Model Selection in Social Research. *Sociological Methodology* **25**, 111–163.

Raftery, Adrian E.(1986). Choosing Models for Cross-Classification. *American Sociological Review* **51**, 145–146.

Raymo, J. M. and Xie Y. (2000). Temporal and Regional Variation in the Strength of Educational Homogamy: Comment on Smits, Ultee, and Lammers. *American Sociological Review* **65**, 773–781.

Recent Demographic Developments in Europe 2000, (2000). Strasbourg: Council of Europe.

Rubin, Z. (1968). Do American Women Marry Up? *American Sociological Review* **33**, 750–760.

Schwartz, Ch. R. and Mare, R. D. (2003). *The Effects of Marriage, Marital Dissolution, and Educational Upgrading on Educational Assortative Mating.* California Center for Population Research. On-line Working Paper Series. (http://repositories.cdlib.org/ccpr/olwp/ccpr-026-03)

Smits, J. (2003). Social Closure among the Higher Educated: Trends in Educational Homogamy in 55 Countries. *Social Science Research* **32**, 251– 277.

Smits, J., Ultee, W. and Lammers, J. (1996). Effects of Occupational Status Differences between Spouses on the Wife's Labor Force Participation and Occupational Achievement: Findings from 12 European Countries. *Journal of Marriage and the Family* **58**, 101–115.

Smits, J., Ultee, W. and Lammers, J. (1998a). Educational Homogamy in 65 Countries: An Explanation of Differences in Openness Using Country-Level Explanatory Variables. *American Sociological Review* **63**, 264–285.

Smits, J., Ultee, W. and Lammers, J. (1998b). Occupational Homogamy in Eight Countries of the European Union, 1975-89. *Acta Sociologica* **42**, 55–68.

Smits, J., Ultee, W. and Lammers, J. (2000). More or Less Educational Homogamy? A test of Different Versions of Modernization Theory Using Cross-Temporal Evidence for 60 Countries. *American Sociological Review* **65**, 781–788.

Sweeney, M. (2002). Economic Prospects and Marriage Formation in the 1970s and 1980s. *American Sociological Review* **67**, 132–147.

Tomlinson, M. (2003). Lifestyle and Social Class. *European Sociological Review* **19**, 97–111.

Treiman, D. J. (1970). Industrialization and Social Stratification. In Lauman, E. (ed.), *Social Stratification: Research and Theory for the 1970s*. Indianapolis: Bobbs-Merrill, pp. 207–234

Treiman, D. J. and Kam-Bor Y. (1989). Educational and Occupational Attainment in 21 Countries. In Kohn, M. (ed.), *Cross-National Research in Sociology*. ASA Presidential Series. Newbury Park: Sage, pp. 373–394

Ultee, W. and Luijkx, R. (1990). Educational Heterogamy and Father-to-Son Occupational Mobility in 23 Industrial Nations: General Societal Openness or Compensatory Strategies of Reproduction? *European Sociological Review* **6**, 125–149.

Ultee, W., Dessens, J. and Jansen, W. (1988). Why Does Unemployment Come in Couples? *European Sociological Review* **4**, 111–122.

Vallet, L. A. (2002). *The Dynamics of Inequality of Educational Opportunity in France: Change in the Association Between Social Background and Education in Thirteen Five-Year Birth Cohorts (1908-1972)*. ISA Research Committee on Social Stratification and Mobility (RC28), Neuchâtel Conference, Switzerland. 7-9 May 2004.

Večerník, J. (1999). Inequalities in Earnings, Incomes, and Household Wealth. In Večerník, J. and Matějů, P (ed.), *Ten Years of Rebuilding Capitalism*. *Czech Society after 1989*. Praha: Academia, pp. 115–136.

Vermunt, J. K. (1997). *LEM: A General Program for the Analysis of Categorical Data.* Tilburg: Tilburg University, (http://www.kub.nl/faculteiten/fsw/organisatie/departementen/mto/software2.html)

Weber, M. (1946). Class, Status, and Power. In. Gerth, H. H. and Wright Mills, C. (ed.), *From Max Weber. Essays in Sociology.* Oxford: Oxford University Press. pp. 180–195.

Winch, R. F. (1958). *Mate-Selection: A Study of Complementary Needs*. New York: Harper and Row.

Xie, Y. (1992). The Log-Multiplicative Layer Effect Model for Comparing Mobility Tables. *American Sociological Review* **57**, 380–395.

Yamaguchi, K. (1987). Models for Comparing Mobility Tables: Toward Parsimony and Substance. *American Sociological Review* **52**, 482–494.

AUTHORS' ADDRESSES

Tomáš Katrňák, Masaryk University, School of Social Studies, Department of Sociology, Gorkého 7, Brno 602 00, Czech Republic, email: katrnak@fss.muni.cz

Martin Keidl, University of California at Los Angeles, Department of Sociology, 264 Haines Hall, 375 Portola Plaza, Los Angeles, CA 90095-1551, USA, email: kreidlm@ucla.edu

Laura Fónadová, Masaryk University, Faculty of Economics and Administration, Department of Public Economy, Lipová 41a, Brno 602 00, Czech Republic, email: laura@enoc.muni.cz

TABLES AND FIGURES

Table 1: Percentage distributions of educational homogamy and types of heterogamy in all new marriages by age at marriage and year in the Czech Republic, Slovakia, Poland, and Hungary between 1988 and 2000.

	Czech Republic			Slovakia			Poland			Hungary		
	M W	M+ W–	M– W+	M W	M+ W–	M– W+	M W	M+ W–	M– W+	M W	M+ W–	M– W+
Years						**All marriages**						
1988	55.6	22.5	21.9	56.9	23.1	20.0	51.7	29.6	18.7	48.8	25.2	26.0
1991	56.5	21.9	21.6	58.2	21.8	20.0	51.9	29.6	18.5	49.9	25.7	24.4
1994	57.8	20.6	21.6	58.3	21.9	19.8	52.0	29.6	18.4	50.5	26.5	23.0
1997	56.5	22.6	20.9	59.0	23.0	18.0	51.1	31.0	17.9	51.2	27.4	21.4
2000	56.0	24.4	19.6	58.7	24.5	16.8	51.9	31.3	16.8	52.1	29.0	18.9
Years						**Age at marriage ≤ 29**						
1988	57.1	22.7	20.2	58.4	22.6	19.0	51.8	29.8	18.4	48.4	26.3	25.3
1991	58.2	21.8	20.0	59.5	21.2	19.3	52.2	29.5	18.3	49.9	26.4	23.7
1994	60.3	20.5	19.2	59.9	21.6	18.5	52.3	29.6	18.1	50.6	27.2	22.2
1997	59.0	23.2	17.8	59.6	23.9	16.5	51.4	31.2	17.4	51.4	28.6	20.0
2000	57.6	26.1	16.3	59.0	25.9	15.1	51.9	31.7	16.4	52.5	30.1	17.4
Years						**Age at marriage 30+**						
1988	51.7	21.8	26.5	49.5	25.1	25.4	51.5	28.6	19.9	50.5	20.9	28.6
1991	51.6	22.1	26.3	51.5	24.4	24.1	49.8	30.0	20.2	50.2	21.8	28.0
1994	51.5	21.2	27.3	50.9	23.7	25.4	49.7	30.0	20.3	49.9	23.0	27.1
1997	52.1	21.3	26.6	56.7	19.9	23.4	49.3	29.9	20.8	50.5	22.6	26.9
2000	53.2	22.0	24.8	58.0	20.5	21.5	51.6	28.8	19.6	51.0	24.9	24.1

Note: MW means educational homogamous marriage (man's level of education is the same as woman's level of education), M+W– means man's hypergamy and woman's hypogamy (man's level of education is lower than woman's level of education), M–W+ means man's hypogamy and woman's hypergamy (man's level of education is higher than woman's level of education).

Table 2: Goodness-of-fit statistics of selected models of educational assortative mating in all new marriages in the Czech Republic, Slovakia, Poland, and Hungary in 1988, 1991, 1994, 1997, and 2000.

Model	Description of the model	df	L^2	Δ	BIC
1) CYAM CYAW	Null association	360	430 080.1	25.14	425 107
2) CYAM CYAW MW	Constant association	351	12 923.4	3.86	8 074
3) CYAM CYAW MW D	Constant association, blocked diagonals	195	1 952.4	0.83	–742
4) CYAM CYAW $(MW)_u$ D	Additive uniform layer effect, blocked diagonals	156	752.5	0.49	–1 403
5) CYAM CYAW $(MW)_x$ D	Log-multiplicative uniform layer effect, blocked diagonals	156	756.1	0.47	–1 399
6) model E, φ(CR)	Log-multiplicative uniform layer effect, blocked diagonals, φ(CR) constant over Y	164	766.5	0.47	–1 499
7) model E, φ(CR) φ(PL)	Log-multiplicative uniform layer effect, blocked diagonals, φ(CR) φ(PL) constant over Y	172	768.5	0.47	–1 608

Note: C – country; Y – year; A – age at marriage; M – men; W – women; D – blocked main diagonals; subscript u – additive uniform layer effect among tables; subscript x – multiplicative uniform layer effect among tables; L2 is the log-likelihood ratio chi-square statistic; df are the degrees of freedom; BIC is Bayesian information criterion (BIC= L2 - (df) log (N)), where N is the total number of cases (1 000 000); Δ is the index of dissimilarity, which indicates the proportion of cases misclassified by the model.

Table 3: Goodness-of-fit statistics of selected models of educational assortative mating in all new marriages in the population below age 30 estimated separately for the Czech Republic, Slovakia, Poland, and Hungary in 1988, 1991, 1994, 1997, and 2000.

Model	Description of model	df	L^2	Δ	BIC
Czech Republic					
1) YM YW	Null association	45	47 588.1	24.06	47 060
2) YM YW MW	Constant association	36	108.5	0.89	–314
3) YM YW $(MW)_u$	Additive uniform layer effect	32	76.6	0.69	–299
4) YM YW $(MW)_x$	Log-multiplicative uniform layer effect	32	69.5	0.65	–306
5) YM YW $(MW)_r$	Regression-type layer effect	24	35.1	0.60	–237
6) YM YW $(MW)_{r+\varphi}$	Regression-type layer effect, φ - specified	27	45.6	0.61	–271
Slovakia					
1) YM YW	Null association	45	57 319.8	24.84	56 792
2) YM YW MW	Constant association	36	291.6	1.45	–131
3) YM YW $(MW)_u$	Additive uniform layer effect	32	242.3	1.62	–133
4) YM YW $(MW)_x$	Log-multiplicative uniform layer effect	32	225.7	1.60	–150
5) YM YW $(MW)_r$	Regression-type layer effect	24	56.9	0.42	–225
6) YM YW $(MW)_{r+\varphi}$	Regression-type layer effect, φ - specified	27	58.5	0.47	–258
Poland					
1) YM YW	Null association	45	39 956.7	21.35	39 429
2) YM YW MW	Constant association	36	79.9	0.87	–343
3) YM YW $(MW)_u$	Additive uniform layer effect	32	75	0.84	–301
4) YM YW $(MW)_x$	Log-multiplicative uniform layer effect	32	77.4	0.86	–298
5) YM YW $(MW)_r$	Regression-type layer effect	24	38.8	0.52	–243
6) YM YW $(MW)_{r+\varphi}$	Regression-type layer effect, φ - specified	27	38.8	0.52	–278
Hungary					
1) YM YW	Null association	45	54 083.1	23.77	53 556
2) YM YW MW	Constant association	36	164.5	1.13	–258
3) YM YW $(MW)_u$	Additive uniform layer effect	32	106.3	0.88	–269
4) YM YW $(MW)_x$	Log-multiplicative uniform layer effect	32	99	0.85	–277
5) YM YW $(MW)_r$	Regression-type layer effect	24	28.8	0.41	–253
6) YM YW $(MW)_{r+\varphi}$	Regression-type layer effect, φ - specified	27	29.9	0.46	–287

Note: Y – year; M – men; W – women; subscript u – additive uniform layer effect among tables; subscript x – multiplicative uniform layer effect among tables; subscript r – regression-type layer effect among tables; subscript r+φ – regression-type layer effect among tables, where φ is specified; L2 is the log-likelihood ratio chi-square statistic; df are the degrees of freedom; BIC is Bayesian information criterion (BIC= L2 - (df) log (N)), where N is the total number of cases per country (250 000); Δ is the index of dissimilarity, which indicates the proportion of cases misclassified by the model.

Table 4: Estimated parameters from Model 6 separately for Slovakia and Hungary

Panel A: Parameters λ_{ij} for baseline pattern of association between men's and women's educational level in 2000

Slovakia					Hungary				
men's educational level	women's educational level				men's education level	women's educational level			
	EL	VT	HS	TE		EL	VT	HS	TE
EL	2.75	0.37	-0.97	-2.15	EL	2.01	0.55	-0.71	-1.85
VT	0.23	0.94	-0.03	-1.14	VT	0.32	0.68	-0.13	-0.87
HS	-0.77	-0.07	0.44	0.40	HS	-0.64	-0.15	0.40	0.39
TE	-2.21	-1.25	0.57	2.89	TE	-1.69	-1.08	0.44	2.33

Note: EL – elementary school, VT – vocational training, HS – high school, TE – tertiary education or university.

Panel B: Parameters ψ_{ij} for pattern of deviation in 1988 from baseline pattern of association in 2000

Slovakia					Hungary				
men's educational level	women's educational level				men's education level	women's educational level			
	EL	VT	HS	TE		EL	VT	HS	TE
EL	-0.51	0.01	0.12	0.38	EL	-0.32	0.02	0.12	0.18
VT	0.12	0.02	-0.11	-0.03	VT	0.13	-0.03	-0.06	-0.04
HS	0.14	-0.05	0.01	-0.1	HS	0.05	0	-0.05	0
TE	0.25	0.01	-0.01	-0.25	TE	0.14	0.01	-0.01	-0.14

Note: EL – elementary school, VT – vocational training, HS – high school, TE – tertiary education or university.

Panel C: Parameters φ_k for strength of deviation over years

Slovakia					Hungary				
1988	1991	1993	1997	2000	1988	1991	1993	1997	2000
1	0.9	0.2	0	0	1	0.9	0.7	0.5	0

Figure 1: Percentage distribution of educational attainment among newlyweds by sex, year, and country. Only individuals below age at marriage 29 in the Czech Republic, Slovakia, Hungary, and Poland between 1988 and 2000.

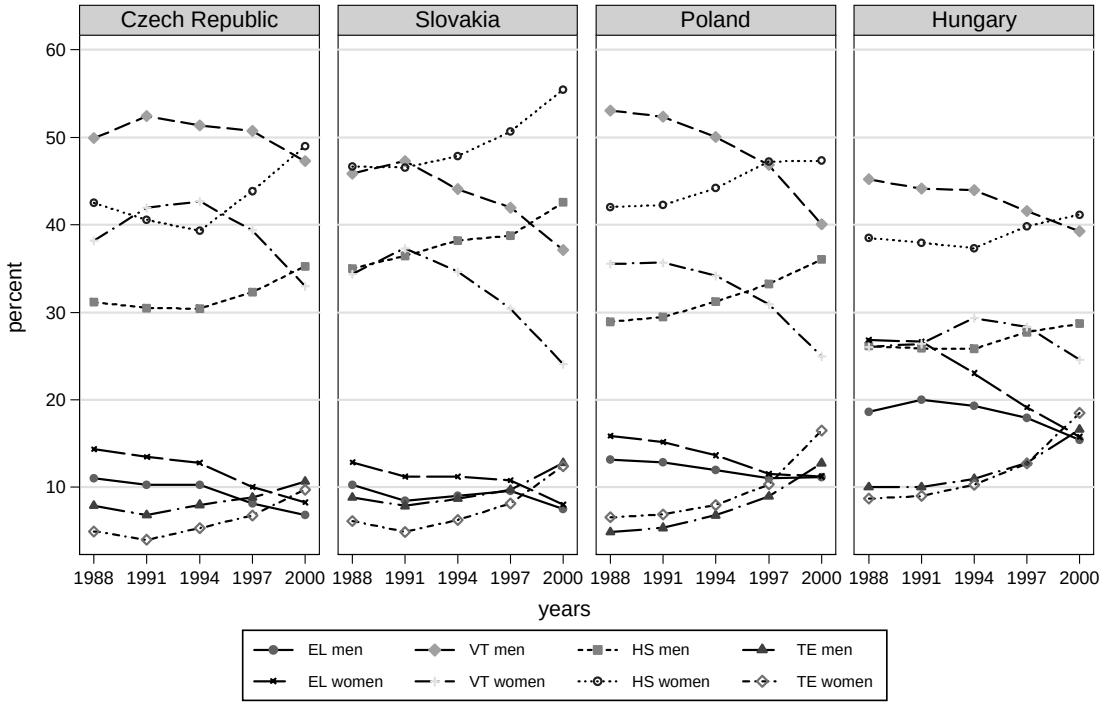


Figure 2: Percentage distribution of educational attainment among newlyweds by sex, year, and country. Only individuals aged at marriage 30 and over in the Czech Republic, Slovakia, Hungary, and Poland between 1988 and 2000.

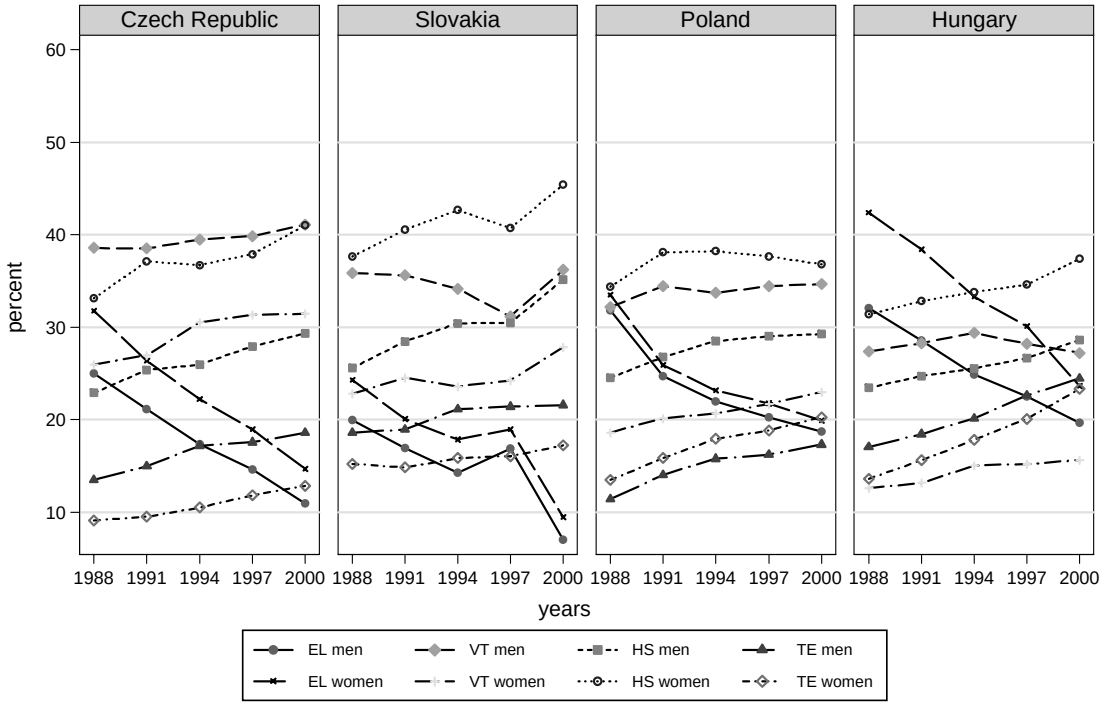
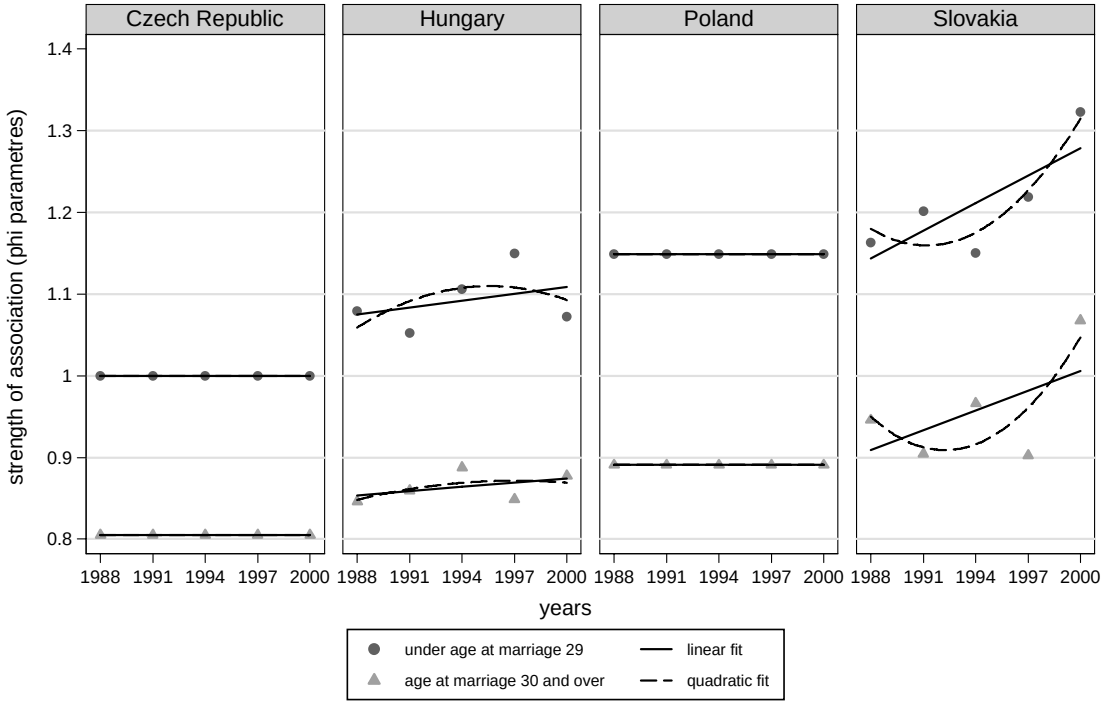


Figure 3: Trends in educational homogamy by age at marriage. Populations of the Czech Republic, Slovakia, Hungary, and Poland between 1988 and 2000.



APPENDIX

Table 5: Frequency distribution of all new marriages by education of spouses and age at marriage in 1988, 1991, 1994, 1997, and 2000 in the Czech Republic

Year	Men's educational level	Age at marriage ≤ 29					Age at marriage 30+				
		Women's educational level					Women's educational level				
		EL	VC	HS	TE	Total	EL	VC	HS	TE	Total
1988	EL	3 741	1 659	1 150	54	6 604	3 843	736	738	101	5 418
	VT	3 473	16 564	9 520	285	29 842	2 092	3 695	2 314	258	8 359
	HS	1 274	4 301	12 119	941	18 635	765	977	2 634	587	4 963
	TE	93	308	2 622	1 688	4711	185	219	1 496	1 026	2 926
	Total	8 581	22 832	25 411	2 968	59 792	6 885	5 627	7 182	1 972	21 666
1991	EL	2 938	1 577	942	35	5 492	2 580	608	631	84	3 903
	VT	3 114	16 573	8 121	233	28 041	1 579	3 312	2 016	213	7 120
	HS	1 077	3 996	10 518	725	16 316	578	885	2 704	525	4 692
	TE	78	313	2 121	1 133	3 645	136	183	1 510	935	2 764
	Total	7 207	22 459	21 702	2 126	53 494	4 873	4 988	6 861	1 757	18 479
1994	EL	2 498	1 071	660	26	4 255	1 921	547	408	66	2 942
	VT	2 009	13 224	5 888	184	21 305	1 250	3 412	1 819	219	6 700
	HS	731	3 171	8 020	691	12 613	475	954	2 437	537	4 403
	TE	56	242	1 739	1 267	3 304	127	264	1 566	961	2 918
	Total	5 294	17 708	16 307	2 168	41 477	3 773	5 177	6 230	1 783	16 963
1997	EL	1 546	929	537	30	3 042	1 869	562	453	121	3 005
	VT	1 610	10 926	6 116	261	18 913	1 355	4 293	2 219	316	8 183
	HS	526	2 623	8 080	810	12 039	520	1 268	3 249	696	5 733
	TE	47	195	1 616	1 427	3 285	141	310	1 863	1 290	3 604
	Total	3 729	14 673	16 349	2 528	37 279	3 885	6 433	7 784	2 423	20 525
2000	EL	1 183	664	421	38	2 306	1 397	495	361	94	2 347
	VT	1 173	8 246	6 261	356	16 036	1 179	4 690	2 591	336	8 796
	HS	409	2 122	8 329	1 100	11 960	433	1 227	3 805	821	6 286
	TE	43	162	1 604	1 803	3 612	132	322	2 021	1 503	3 978
	Total	2 808	11 194	16 615	3 297	33 914	3 141	6 734	8 778	2 754	21 407

Note: EL – elementary school, VT – vocational training, HS – high school, TE – tertiary education.
Source: Czech Statistical Office.

Table 6: Frequency distribution of all new marriages by education of spouses and age at marriage in 1988, 1991, 1994, 1997, and 2000 in Slovakia

Year	Men's educational level	Age at marriage ≤ 29					Age at marriage 30+				
		Women's educational level					Women's educational level				
		EL	VC	HS	TE	Total	EL	VC	HS	TE	Total
1988	EL	1921	790	460	16	3187	842	215	217	29	1303
	VT	1562	7506	4964	163	14195	525	950	753	116	2344
	HS	463	2207	7552	621	10843	191	265	906	310	1672
	TE	24	142	1469	1098	2733	30	61	585	540	1216
	Total	3970	10645	14445	1898	30958	1588	1491	2461	995	6535
1991	EL	1361	641	312	11	2325	558	165	127	26	876
	VT	1260	7336	4315	119	13030	316	819	626	82	1843
	HS	449	2204	6927	461	10041	133	238	866	236	1473
	TE	19	103	1272	759	2153	31	47	479	423	980
	Total	3089	10284	12826	1350	27549	1038	1269	2098	767	5172
1994	EL	1406	401	262	5	2074	491	130	101	17	739
	VT	840	5483	3710	93	10126	290	759	649	73	1771
	HS	324	1972	6007	475	8778	123	276	916	262	1577
	TE	10	101	1014	868	1993	22	59	546	470	1097
	Total	2580	7957	10993	1441	22971	926	1224	2212	822	5184
1997	EL	1393	416	257	10	2076	774	125	117	38	1054
	VT	682	4516	3806	114	9118	265	984	613	82	1944
	HS	255	1604	5976	584	8419	121	349	1164	268	1902
	TE	9	74	963	1060	2106	22	54	646	614	1336
	Total	2339	6610	11002	1768	21719	1182	1512	2540	1002	6236
2000	EL	907	325	191	8	1431	315	92	66	9	482
	VT	452	3014	3415	178	7059	224	1402	774	98	2498
	HS	156	1195	5929	815	8095	100	369	1577	375	2421
	TE	7	47	1014	1362	2430	14	56	713	704	1487
	Total	1522	4581	10549	2363	19015	653	1919	3130	1186	6888

Note: EL – elementary school, VT – vocational training, HS – high school, TE – tertiary education.
Source: Slovak Statistical Office.

Table 7: Frequency distribution of all new marriages by education of spouses and age at marriage in 1988, 1991, 1994, 1997, and 2000 in Poland

Year	Men's educational level	Age at marriage ≤ 29					Age at marriage 30+				
		Women's educational level					Women's educational level				
		EL	VC	HS	TE	Total	EL	VC	HS	TE	Total
1988	EL	11647	10687	5343	299	27976	7925	1662	1735	195	11517
	VT	18550	53047	37909	3180	112686	2879	3730	4261	773	11643
	HS	3417	11332	40763	5883	61395	1201	1174	4776	1720	8871
	TE	126	431	5273	4531	10361	110	162	1665	2186	4123
	Total	33740	75497	89288	13893	212418	12115	6728	12437	4874	36154
1991	EL	10439	10277	5204	307	26227	4880	1359	1431	170	7840
	VT	17030	51189	35824	3055	107098	2305	3711	4139	768	10923
	HS	3368	11011	40117	5779	60275	921	1153	4767	1652	8493
	TE	158	504	5337	4954	10953	105	168	1744	2435	4452
	Total	30995	72981	86482	14095	204553	8211	6391	12081	5025	31708
1994	EL	8146	8722	4636	255	21759	3712	1184	1075	156	6127
	VT	13512	42863	32238	2542	91155	1818	3317	3541	721	9397
	HS	3006	10224	38099	5535	56864	830	1077	4377	1664	7948
	TE	163	486	5539	6189	12377	97	183	1664	2453	4397
	Total	24827	62295	80512	14521	182155	6457	5761	10657	4994	27869
1997	EL	6549	7877	4889	282	19597	3199	1130	962	172	5463
	VT	11044	36729	32902	2644	83319	1796	3364	3394	723	9277
	HS	2817	9857	39566	6870	59110	781	1179	4199	1656	7815
	TE	137	512	6682	8571	15902	85	173	1586	2523	4367
	Total	20547	54975	84039	18367	177928	5861	5846	10141	5074	26922
2000	EL	8280	6623	5009	444	20356	3163	1110	904	136	5313
	VT	9318	29562	30648	3756	73284	1700	3936	3426	770	9832
	HS	2799	8913	42695	11458	65865	686	1281	4509	1824	8300
	TE	156	533	8169	14431	23289	94	193	1601	3023	4911
	Total	20553	45631	86521	30089	182794	5643	6520	10440	5753	28356

Note: EL – elementary school, VT – vocational training, HS – high school, TE – tertiary education.
Source: Polish Statistical Office.

Table 8: Frequency distribution of all new marriages by education of spouses and age at marriage in 1988, 1991, 1994, 1997, and 2000 in Hungary

Year	Men's educational level	Age at marriage ≤ 29					Age at marriage 30+				
		Women's educational level					Women's educational level				
		EL	VC	HS	TE	Total	EL	VC	HS	TE	Total
1988	EL	6194	2211	1446	94	9945	3085	348	524	65	4022
	VT	6561	8804	8115	655	24135	1439	790	1030	173	3432
	HS	1430	2587	8448	1493	13958	654	345	1463	476	2938
	TE	137	279	2531	2394	5341	136	93	916	991	2136
	Total	14322	13881	20540	4636	53379	5314	1576	3933	1705	12528
1991	EL	6355	2268	1491	82	10196	2198	272	390	56	2916
	VT	5747	8621	7496	638	22502	1109	716	905	159	2889
	HS	1321	2294	8074	1499	13188	518	284	1281	443	2526
	TE	153	284	2293	2366	5096	98	73	776	936	1883
	Total	13576	13467	19354	4585	50982	3923	1345	3352	1594	10214
1994	EL	4988	2292	1244	78	8602	1685	300	351	44	2380
	VT	4231	8224	6493	607	19555	980	775	895	163	2813
	HS	950	2310	6833	1398	11491	434	296	1266	448	2444
	TE	89	241	2052	2500	4882	88	67	722	1050	1927
	Total	10258	13067	16622	4583	44530	3187	1438	3234	1705	9564
1997	EL	3698	1956	1037	80	6771	1444	262	295	48	2049
	VT	2795	6649	5668	598	15710	853	719	814	182	2568
	HS	672	1929	6423	1460	10484	349	320	1296	464	2429
	TE	63	175	1930	2661	4829	94	84	747	1135	2060
	Total	7228	10709	15058	4799	37794	2740	1385	3152	1829	9106
2000	EL	3269	1439	961	94	5763	1367	297	370	78	2 112
	VT	2045	5842	5920	865	14672	760	888	1055	218	2921
	HS	518	1692	6527	1988	10725	347	408	1664	655	3074
	TE	55	213	1976	3959	6203	61	86	925	1554	2626
	Total	5887	9186	15384	6906	37363	2535	1679	4014	2505	10733

Note: EL – elementary school, VT – vocational training, HS – high school, TE – tertiary education.
Source: Hungarian Statistical Office.